REMARKS

Claims 1–7 and 13–16 are pending in the application. In the Office action dated September 5, 2008, claims 1–7 and 13–16 were rejected. Responsive to the Office action, Applicants have amended claims 1, 2, 4, 13, 15 and 16; and have added new claims 17–19.

In view of the above amendments, and the following remarks, Applicants respectfully request reconsideration of the application under 37 C.F.R. § 1.111.

Amendments to the Claims

Applicants take this opportunity to add new claims 17–19. The new claims depend from existing claims 1 and 13, and serve to further clarify the substrate and precursor materials recited in those claims.

Rejections under 35 U.S.C. § 112

Claims 1–7 and 13–16 are rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

In particular, the Examiner asserts that claims 1, 2, 4, and 13 should be rewritten to clearly set forth the claimed invention; that the term bottom" in claim 15 lacks antecedent basis; and that the term "similar" in claim 16 in unclear.

In response, claims 1, 2, 4, 13, 15, and 16 are amended as requested by the Examiner. Applicants suggest that, in view of the above amendments, claims 1–7 and 13–16 particularly and distinctly claim the recited subject matter. Applicants therefore respectfully request the withdrawal of the rejection of claims 1–7 and 13–16 under 35 U.S.C. § 112, second paragraph.

Obviousness-Type Double Patenting

Claims 1–7 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1–11 of U.S. Patent no. 7,001,870 (Iida et al.).

The Examiner asserts that the claims are not patentably distinct from each other because the claims of Iida et al. are directed to a method for producing an oxide superconductor

by melt processing. Applicants respectfully disagree.

The claims of U.S. Patent no. 7,001,870 recite a method for joining an "RE123 superconductor." The method includes aligning a plane of the RE123 superconductor, interposing a solder material composed of an RE123 oxide superconductor, and melting and then solidifying the solder material.

In contrast, the present claims recite a method for producing an oxide superconductor, where the method includes "placing a precursor of an oxide superconductor on a substrate material containing pure metal or a compound which is meltable in the precursor when the precursor is partially molten, and producing the oxide superconductor by partial melting and solidifying the precursor in said state."

The precursor of claim 1 is not itself an oxide superconductor, as recited by the claims of U.S. 7,001,870. As disclosed in the present specification at page 23, lines 14 to 17: "The precursor 5 of the aforementioned oxide superconductor is a compact of a mixture of raw materials wherein the mixture has the same or a similar composition as the composition of the target oxide superconductor."

Furthermore, the substrate material of claim 1 is not required to be a superconductor, and even after the partial melting and solidification of the precursor, the substrate material is not required to be a superconductor. In contrast, the RE123 oxide superconductor material of US Patent No. 7001870 is required to be a superconductor material both before and after the melting step for joining the 123 oxide superconductors.

Applicants respectfully suggest that the content of claims 1–11 of U.S. Patent no. 7,001,870 fails to provide a suggestion or motivation to arrive at the dissimilar method of the instant claims. The use of an oxide superconductor precursor is not suggested by the cited claims, nor is a method of producing an oxide superconductor, as the cited claims are directed to a method of joining superconductors and not their preparation from nonsuperconductive materials.

In view of the above remarks, Applicants respectfully suggest that pending claims 1–7 are not rendered *prima facie* obvious by the claims of U.S. Patent no. 7,001,870, and they request that the nonstatutory double patenting rejection of claims 1–7 be withdrawn.

Rejections under 35 U.S.C. § 103

The Examiner has rejected claims 1–7 under 35 U.S.C. § 103(a) as being unpatentable over Iida et al. (U.S. Patent no. 7,001,870).

The Examiner has asserted that the present claims would have been obvious to one of ordinary skill in the art over the teachings of Iida et al, as the reference is directed to a process of melt processing to produce an oxide superconductor by placing a meltable compound on the superconductor, followed by melting and solidifying the same. Applicants respectfully disagree.

Somewhat like the present application, the Iida et al. reference is concerned with the preparation of large pieces of superconducting material. However, unlike the present method, Iida et al. prepare large superconductors by soldering two existing superconductors together using a superconductor solder.

Specifically, as discussed above with respect to the nonstatutory double-patenting rejection of claims 1–7, the Iida et al. reference is not directed to the preparation of oxide superconductor, rather Iida et al. is directed to "a method for joining an RE123 oxide superconductor matrix obtained by a melt process by the use of a solder material" (see the abstract of Iida et al.).

As recited by Iida et al., the preparation of large superconductors is accomplished by joining two existing RE123 superconductor matrices by first joining parallel to the (110) crystallographic plane, and using a high density RE123 superconductor compact with a lower melting point than the matrix as the solder material. By heating, melting, and solidifying the solder material, an RE123 oxide superconductor may be prepared with "no segregation of impurities and pores in the joined portion".

In contrast, instant claim 1 recites a method of placing a <u>precursor</u> of an oxide

superconductor on a substrate material, which contains a pure metal or a compound which is meltable in the precursor when the precursor is partially molten, and subsequent partial melting and solidifying of the precursor on the substrate material results in the formation of a large bulk oxide superconductor. The instant method can be used to prepare very large bulk oxide superconductors without the formation of regions which are prone to form stress concentration cracks. This is of some importance, because as stated in the specification (see page 2, para. 3; page 3, para. 3; and page 6, para. 2 to page 8, para. 4) previously utilized methods were unable to prepare large bulk-shaped oxide superconductors without the propagation of cracks in the material.

Applicants suggest that the Iida et al. reference cannot be used to establish the *prima facie* obviousness of the claimed invention, because Iida et al. fails to disclose the use of superconductor precursor, and fails to disclose the preparation of a superconductor from that superconductor precursor. Furthermore, there can be no motivation to modify the Iida et al. reference in order to arrive at the claimed invention, because doing so would change the principle of the Iida et al. reference, specifically, that of joining smaller units of existing superconductor to form a larger superconductor unit.

In view of the above remarks, Applicants respectfully suggest that the rejection of claims 1–7 under 35 U.S.C. § 103(a) over Iida et al. be withdrawn.

Claims 1–7 and 13–16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Murakami (U.S. Patent no. 5,521,150).

The Examiner asserts that Murakami discloses every element of the claimed invention, except for teaching that the superconductor precursor is placed on the substrate. The Examiner further asserts that as the reference teaches that adding the substrate to the precursor, it would have been obvious to one of ordinary skill to turn the structure over to put the precursor on the substrate rather than vice versa. Applicants respectfully disagree.

Murakami et al. is directed to a method of joining Y-based oxide superconductors.

Specifically, Murakami et al. disclose joining Y-based oxide superconductors by inserting thin portions of superconducting RE-$Ba_2Cu_3O_{7-\delta}$ between the Y-based oxide superconductors, and applying heat and pressure to the resulting sandwich.

This process is distinct from the method of claims 1 and 13, where a superconductor precursor is placed on a substrate, and then partially melted and solidified to produce an oxide superconductor. Applicants' precursor material is not a superconductor until after partial melting and solidifying has been carried out.

Furthermore, the thin pieces of the superconductor RE-$Ba_2Cu_3O_{7-\delta}$ disclosed by Murakami et al. are required to be superconducting, which is distinct from the substrate material recited in instant claim 1, which contains "pure metal or a compound which is meltable in the precursor when the precursor in partially molten." Applicants suggest that a superconducting compound having the explicit formula RE-$Ba_2Cu_3O_{7-\delta}$ cannot serve to motivate one of ordinary skill to select instead a "pure metal or a compound which is meltable" as a nonsuperconductive substrate, and there is no teaching or suggestion in Murakami et al. which would motivate such a strange substitution.

Applicants respectfully suggest that Murakami et al. fails to establish the *prima facie* obviousness of the invention of claim 1, and therefore, fails to establish the *prima facie* obviousness of claims 2–7. Applicants request the withdrawal of the rejection of claims 1–7 under 35 U.S.C. § 103(a).

With respect to instant claim 13, the claim recites a RE-Ba-Cu-O based oxide superconductor which has a portion exposed to the outside and solidified after melting, where the solidified portion is generated from a substrate material which is used for supporting a precursor of the RE-Ba-Cu-O based oxide superconductor when the precursor was melted and solidified.

As discussed above, Murakami et al. discloses a method for joining Y-based oxide superconductors wherein thin pieces of the superconductor RE-$Ba_2Cu_3O_{7-\delta}$ are inserted

between the Y-based oxide superconductors and pressure and heating are applied.

The Y-based oxide superconductor of Murakami is different in composition and form from the oxide superconductor of claim 13, for at least the reason that the superconductor precursor is not a superconductor until after the partial melting and solidifying steps have been conducted.

The thin pieces of the superconductor RE-$Ba_2Cu_3O_{7-\delta}$ of Murakami et al. are distinct from the substrate material recited by claim 13, since the thin pieces of the superconductor RE-$Ba_2Cu_3O_{7-\delta}$ are already superconductors prior to the application of heat and pressure.

Applicants suggest that the subject matter of claim 13 is not rendered *prima facie* obvious by Murakami et al. Similarly, claims 14 and 15 are also not rendered *prima facie* obvious by Murakami et al. Applicants therefore respectfully request the withdrawal of the rejection of claims 13–15 In this way, Claim 13 is not taught or suggested by US Patent No. 5521150, and therefore Claim 13 is believed to be allowable. Dependent Claims 14–16 are believed to be allowable for at least the reasons that claim 13 is believed to be allowable.

In view of the above remarks, Applicants respectfully request the withdrawal of the rejection of claims 13–16 under 35 U.S.C. § 103(a).

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Applicants suggest that the claims are now in condition for allowance. If there are any questions regarding this paper, or if a telephone conference would prove helpful, the Examiner is encouraged to contact the undersigned agent.

Respectfully submitted,

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